Name: ______________________________

# GCSE (1 – 9)

# Direct and Inverse Proportion

**Instructions**

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

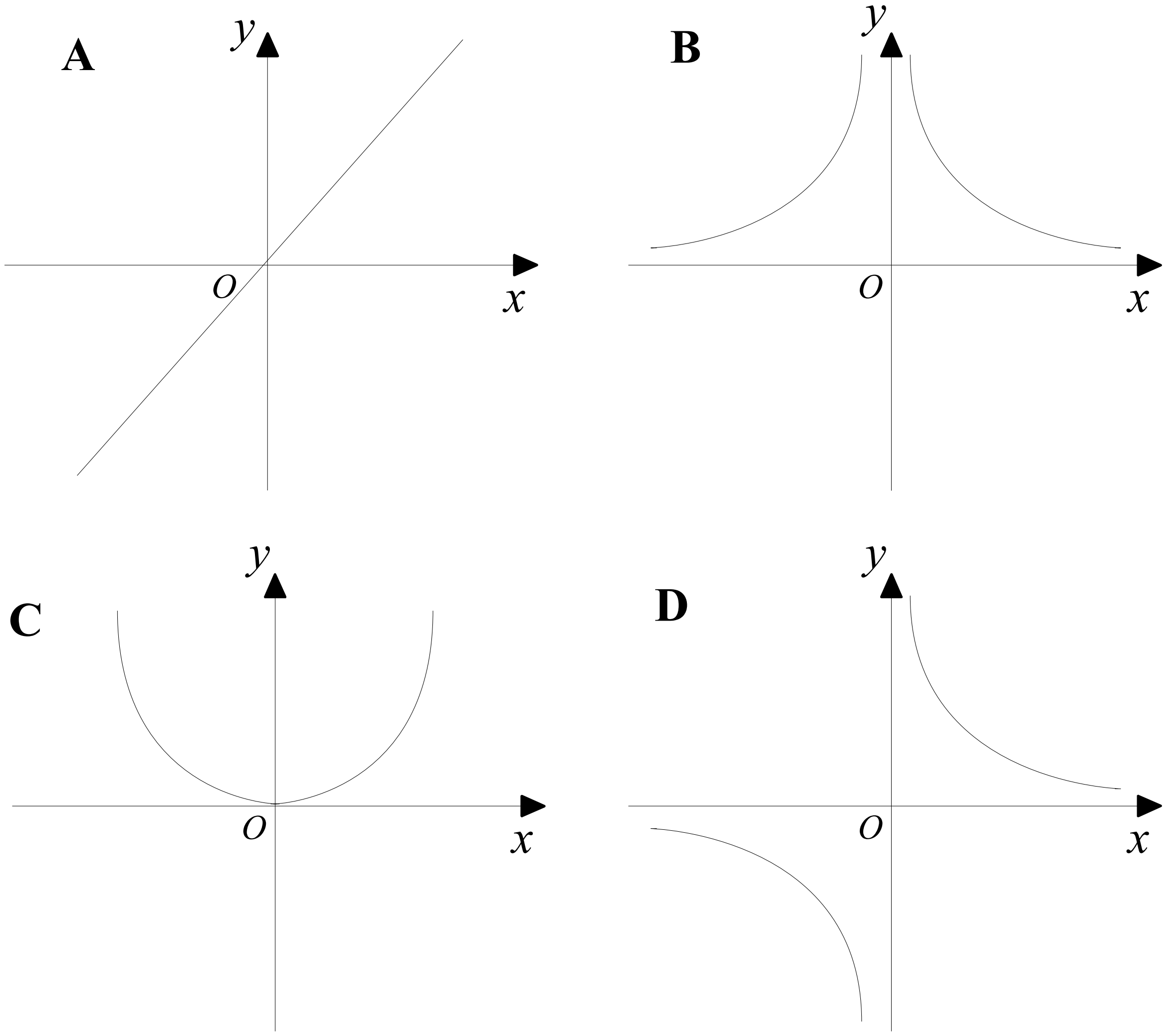
**Information**

- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

**Advice**

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

**1** Here are four graphs.




Match each graph with a statement in the table below.

| **Proportionality relationship** | **Graph letter** |
|---|---|
| $y$ is directly proportional to $x$ | |
| $y$ is inversely proportional to $x$ | |
| $y$ is directly proportional to $x^2$ | |
| $y$ is inversely proportional to $x^2$ | |

**(Total for question 1 is 2 marks)**

**2** $a$ is directly proportional to $b$

When $a = 7$, $b = 28$

Find the value of $b$ when $a = 5$

$b$ =…..........................

**(Total for question 2 is 3 marks)**

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**3** $c$ is inversely proportional to $d$

When $c = 3$, $d = 8$

Find the value of $c$ when $d = 2$

$c$ =…..........................

**(Total for question 3 is 3 marks)**

**4** $e$ is directly proportional to $f$

When $e = 3$, $f = 36$

Find the value of $f$ when $e = 4$

$f$ =…..........................

**(Total for question 4 is 3 marks)**

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**5** $g$ is directly proportional to the square root of $h$

When $g = 18$, $h = 16$

Find the possible values of $h$ when $g = 2$

$h$ =…..........................

**(Total for question 5 is 3 marks)**

**6** $y$ is inversely proportional to $x$

When $y = 15$, $x = 4$

Find the value of $y$ when $x = 12$

$y =$…..........................

**(Total for question 6 is 3 marks)**

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**7** $x$ is inversely proportional to the square root of $y$

When $x = 12$, $y = 9$

Find the value of $x$ when $y = 81$

$x =$…..........................

**(Total for question 7 is 3 marks)**

**8** $y$ is inversely proportional to the cube of $x$

When $y = 250$, $x = 0.2$

Find the value of $y$ when $x = 0.5$

$y$ =…..........................

**(Total for question 8 is 3 marks)**

**9** $x$ is directly proportional to the cube of $y$

When $x = 32$, $y = 0.4$

Find the value of $y$ when $x = 256$

$y$ =…..........................

**(Total for question 9 is 3 marks)**

**10** The table shows pairs of values for $x$ and $y$

| $x$ | 2 | 3 |
|---|---|---|
| $y$ | 32 | 72 |

(i) Tick the correct statement below.

$y \propto x$ ……………….

$y \propto x^2$ ……………….

$y \propto x^3$ ……………….

(ii) Write a formula for $y$ in terms of $x$

……………………….

**(Total for question 10 is 4 marks)**

**11** The table shows pairs of values for $x$ and $y$

| $x$ | 4 | 5 |
|---|---|---|
| $y$ | 256 | 500 |

(i) Tick the correct statement below.

$y \propto x$ …..................

$y \propto x^2$ …..................

$y \propto x^3$ …..................

(ii) Write a formula for $y$ in terms of $x$

…..........................

**(Total for question 11 is 4 marks)**